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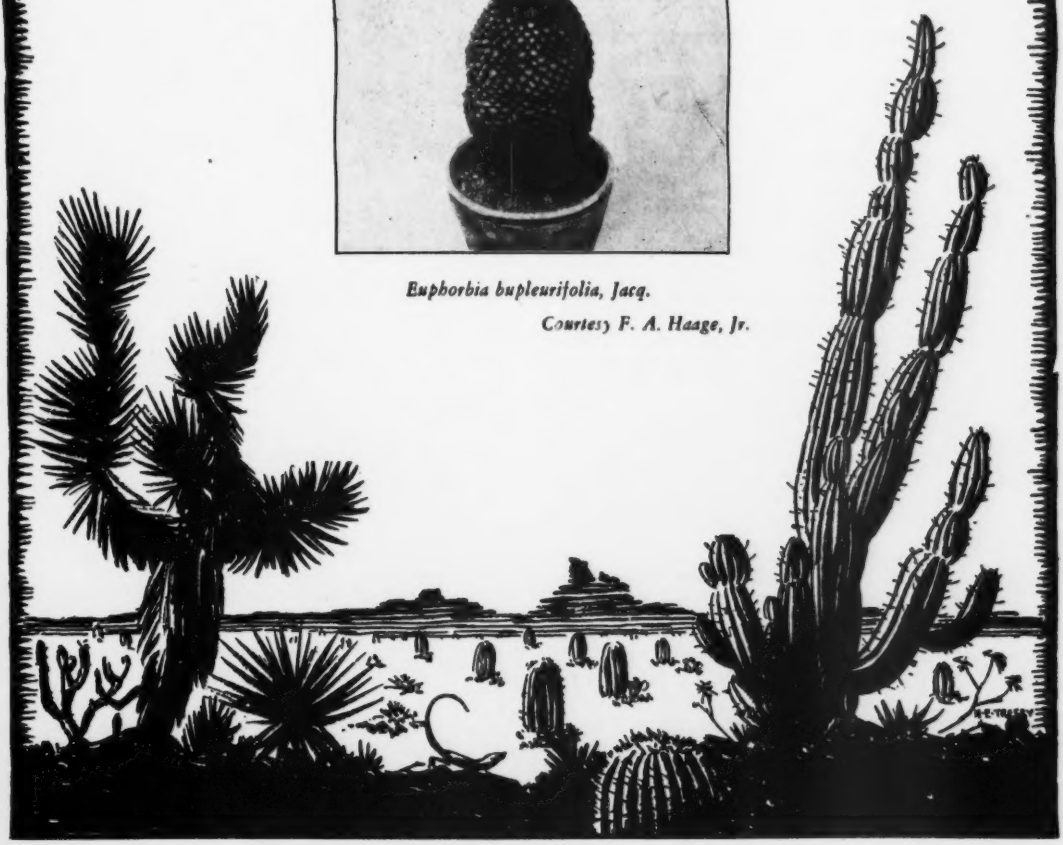
CACTUS AND SUCCULENT JOURNAL

Of the Cactus And Succulent Society
Of America

VOL. I DECEMBER, 1929 No. 6

Euphorbia bupleurifolia, Jacq.

Courtesy F. A. Haage, Jr.



JOURNAL OF THE CACTUS AND
SUCCULENT SOCIETY OF AMERICA

A monthly magazine devoted exclusively to Cacti and Succulents for the dissemination of knowledge and the recording of hitherto unpublished data in order that the culture and study of these particular plants may attain the popularity which is justly theirs. "The Cactaceae," by N. L. Britton and J. N. Rose, has been adopted by this Journal for purposes of identification.

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Adelaide, South Australia.

Dear Mr. Willis:—

I cannot leave California without thanking all those who have been so extraordinarily kind and helpful both here and in Arizona.

The cultivation of Australian plants in both states is a revelation, both in point of number of species and excellence of growth. My expectations were far exceeded. Many of our rarest plants, far removed from their enemies, seem well established. If I have any criticism to offer it is that the rain precipitation of some parts of Australia is much underestimated and the plants are being kept on the dry side. It is safe to say that a very few will suffer from liberal watering. Then, too, the Australian xerophytes are as a rule impatient of nursing and are quite ready to look after themselves if put out ever so young.

I was much thrilled by my first view of cacti growing in the wild. In Australia, where one has to build up a collection by importations from Mexico, it is possible to have a representative collection of good specimens; but one feels that it is like having an aviary full of rare birds, after browsing in the Arizona cactus country.

While spending a week at the Boyce-Thompson Arboretum at Superior, Dr. Crider kindly took me to the cactus forest near Tucson and there with Dr. Vorbers I took a great number of photographs of this marvelous assemblage. The Boyce-Thompson Arboretum was my main objective and I was given every opportunity to study the desert plants of the region with the view of elucidating some problems facing us in the arid parts of Australia.

The great collection of succulents and cacti at the Huntington Gardens eclipses anything of the kind I know in the world in the number and grandeur of its specimens and in the excellence of their presentation. I must especially thank the energetic Director of this showplace of the world for his kind reception and assistance. While there it was a joy to meet Mr. Walther, who has an uncanny knowledge of Australian plants, only approached by Mr. Hugh Evans of Santa Monica, whose beautiful garden contained some Australians I had never seen.

I notice that plant collectors are very contented people and that in spite of the great collections in their neighborhood presenting an unattainable objective, the Californians have numbers of interesting individual assemblages such as those of Mr. Mendel, Mr. Lee Chambers, Mr. Frick, Mr. Willis, and others, all of whom have been specially kind and helpful.

At Santa Barbara Mr. Orpet piloted me through the Public Park with its wonderful colony of Australian plants, and enabled me to see the lovely and unusual garden of Mr. and Mrs. Wright and his own important nursery collection.

We are always on the look-out for what we have not got and the noticeable thing in California is the great interest taken in Euphorbias. I must say that the study of this group has been taken up more thoroughly than in Australia. But as it has been a favorite family of mine in the study of South African plants I hope to present a paper on the genus to your Journal. This Journal of yours is excellent and will do much to stimulate the love of plants, and by its circulation make contacts with the collectors and botanists of the world. I wish it every success.

I remain,

Yours very truly,
ROBERT PULLEINE

ALOES

By ERIC WALTHER

A journal intended to further stimulate interest in the cultivation of succulents may not be an appropriate place to mention it, but there are

Photo by L. C. Allen, S. F.
Aloe X *saponaria* + *striata*

still quite a few people who think of cacti only as living pin-cushions, and of succulent-fanciers as mere collectors pursuing the cult of the unusual. It need scarcely be said that this view is not shared by the writer, being a long ways indeed from the truth, not only disregarding entirely the scientific aspects, but the almost proverbial generosity of the succulent-fraternity as well.

Another, perhaps more apt criticism often made of cacti is that they can scarcely ever serve to make even the semblance of a garden, smacking much too strongly of the desert, and negativing California's claim of being the garden-paradise of the Union. While of course no one will even for a moment advocate filling our gardens with cacti exclusively, it must be admitted that it is rather difficult to combine them with other ornamentals into a harmonious garden-picture. Still, a scarcity of water may often make advisable the cultivation of xerophytes; and it by no means follows that as a consequence we shall have to abandon all hope of the beautiful.

Many cacti bear flowers scarcely equalled in beauty by any other class of plants; and the writer wishes to use this opportunity for calling attention to the fact that there are many other succulents available, needing equally little water, more adaptable to the needs of garden design, and at the same time producing an abundance of showy blossoms. Foremost among the latter would seem to be the genus *Aloe*, with numerour species bearing many brightly colored flowers, largely during the winter months; and it is really surprising that, considering the ease of culture and propagation, these plants are not more frequently met with in our gardens.

No less surprising is it that of over 170 species enumerated by Alwin Berger in 1908, when he monographed the genus, only about 30 have so far found their way into more general cultivation here. No doubt many of the 140 or more species still awaiting introduction should be as showy, if not more so, than those now known here; and a few of the more feritorious species may be worth mentioning, as *Aloe aethiopica, A. africana, A. candelabrum, A. capitata, A. comosa, A. dichotoma, A. laxiflora* and *A. marshalli.*

Photo by L. C. Allen, S. F.
Aloe arborescens var. *natalensis*

Some of these are real trees in their native home, reaching a height of from 5 to 60 feet, (yes, sixty); and while the latter's absolute hardiness can scarcely be guaranteed, they should thrive wherever citrus is grown successfully. Surely, here is a promising field for the plant-introducer; and the writer was pleased to note, on a

recent visit to Santa Barbara, quite a number of newly introduced species in the garden of our friend Orpet, especially worth mentioning being *Aloe bainesi, A. greeni, A. longistyla, A. myriacantha, A. pratensis* and *A. speciosa.*

The genus *Aloe* would seem to offer an equally promising field to the enterprising plant-breeder. When first considering this aspect of the genus under discussion it occurred to the writer whether it might not be possible to cross such divergent forms as *Aloe plicatilis* and *A. variegata.* Curiously enough, this particular hybrid actually has been known for at least 25 years, an example of it having flowered that long ago at La Mortola, and described at the time by Berger under the name of *Aloe corderoyi.* Work with some of the tree-like species should also be very promising, and it would not appear impossible, for instance, to cross *Aloe bainesi,* in its native home, Natal, often attaining a height of over 30 feet, with some of the hardier species, as *A. arborescens.* The visulization of a California landscape featured by trees of the general aspect and size of the common *Cordyline australis,* but bearing masses of showy flowers and needing much less water, is by no means over sanguine.

Interesting potentialities are also held by the demonstrated possibility of crossing *Aloe* with various species of *Gasteria,* quite a number of such crosses already being known. The 2 genera are evidently closely allied, and were formerly thought to constitute a single genus. Quite a number of such crosses are grown in our gardens under various names. The least that can be said about the latter is that their standing is very uncertain, being based on very scant descriptions. This group has just been engaging the attention of the writer who may have something more to say about it soon.

Before proceeding to the introduction of any further species new to our gardens it would seem desirable to carefully check up on the ones already here, and it is hoped that the appended key may be found useful in this task. The said key is based on Alwin Berger's treatment of the genus in Engler's "Pflanzenreich"; and includes only the more commonly grown species. The writer would welcome notice of any serious omissions and errors, as well as any material submitted for determination. For the present, address the author, care of the "Huntington Botanic Gardens," San Marino, and enclose a stamped and addressed envelope. Material should consist of both flowers and leaves, or even better, a piece capable of being grown on.

A few words as to culture may be in order here. Aloes can be grown almost anywhere, but usually respond most gratefully to somewhat better soil than answers for most cacti, as long as it is well drained, appreciating also frequent watering, at least during their growing season. Usually a sunny location is to be preferred, but some of the species, especially in the warmer parts of the state, may prove to thrive better in at least partial shade.

As to the possibility of creating a successful garden-picture by the use of Aloes, the dry garden recently completed by Mr. Hugh Evans at his Santa Monica home, so well known for its comprehensive collection of choice ornaments, may be cited, where cacti are conspicuous by their rarity.

Aside from the insiduous nematode, and the occasionally troublesome mealybug (*Pseudococcus gahani*), no serious pest appears to trouble the Aloes with us, the only other insects noted by the wriater being a scale (*Aspidiotus* sp.), and an aphis (probably *Anuraphis tulipae*) sometimes found infesting the flower-cluster. Possibly the peculiar sap of the plants, known to possess medicinal virtue since before Pliny's time, may be the cause of the plant's relative freedom from more serious insect-pests.

Propagation is very simple and easy, most species making an abundance of off-shoots and branches, readily rooting if inserted in the ground, preferably after having been dried previously for a little while; and other species spread by means of underground runners giving rise to new plants that may be detached already rooted. Seed is often available in quantity and furnishes a ready means of increase, and even if usually the seedlings may take longer to reach flowering age, than cuttings, some of them have been known to flower within 3 years after sowing. Unfortunately the various species cross very freely in cultivation owing to the intervention of the ever-busy bee, so that it is rare to obtain seed true to name from plants grown in gardens. The pollen of *Aloe saponaria* especially seems to enter most freely into these illegitimate unions, but many of the resultant hybrids are quite desirable plants, being often exceptionally vigorous and free-flowering. It is to be hoped though, that the owners will take pity on the poor botanist, and not expect him to have a name ready offhand for every one of these hybrids.

The species of *Aloe* treated in the key following are all indigenous to South Africa unless otherwise stated. The following short description may serve to distinguish *Aloe* from the allied genera *Apicra, Haworthia* and *Gasteria,* of which more may be said on another occasion.

GENERIC DESCRIPTION: *Plants* usually succulent, small to large, with *stem* tall, or short, or none; *leaves* mostly fleshy, usually more or less strongly toothed, rarely entire, often

blotched; *racemes* mostly many-flowered, only very rarely one-sided; *flowers* large, pendulous or spreading, more or less colored red, yellow, orange or very rarely white, usually cylindrical, rarely inflated at base and then never with the apex recurved as well; *perianth-segments* free or more or less connate; *fruit* a dry, dehiscent capsule.

ALOE Linn. Key to the species:

(By Eric Walther, after A. Berger.)

1a. Lvs. strictly 2-ranked, strapshaped, obtuse ..... *A. plicatilis* (L.) Mill.
—b. Lvs. in three or many spiral ranks 2
2a. Lvs. 3-ranked, triangular in section, grooved above, rough-edged, blotched, dark-green *A. variegata* L.
—b. Lvs. spirally many-ranked 3
3a. Lvs. in dense rosettes, crowded either at ground level ,or at end of bare stem 7
—b. Lvs. borne along the more or less elongated stem, often scattered; stem often procumbent 4
4a. Lvs. thin, finely denticulate at margins, not armed on back; stems weak, often trailing; peduncles unbranched 5
—b. Lvs. thick, with stout teeth at edges and on back; stems stout, occasionally erect; peduncles usually branched 6
5a. Fls. orange; stems usually trailing; lvs. less than 6″ long ..... *A. ciliaris* Haw.
—b. Fls. greenish-yellow; stems mostly ascending; lvs. to 8″ long ..... *A. striatula* Haw.
6a. (4b) Lvs. ovate, ¾″ long; racems shortly capitate bracts shorter than broad; perianth-segments long-connate ..... *A. distans* Haw.
—b. Lvs. ovate-lanceolate, 4-6″ long; racemes to 6″ long, bracts acute, longer than broad; perianth-segments more or less free ..... *A. mitriformis* Mill.
7a. (3a) Plants with stout, columnar, usually undivided trunk; perianth-segments more or less connate; filaments more or less exserted 8
—b. Trunk none, or slender and usually branched from the base or clustered 10
8a. Racemes erect, cylindrical; fls. spreading equally on all sides ..... *A. supralaevis* Haw.
—b. Racemes spreading or obliquely, more or less one-sided; with flowers more or less deflexed 9
9a. Racemes borne almost horizontally; fls. all crowded on lower side of rhachis ..... *A. marlothi* Berger
—b. Racemes obliquely-ascending; fls. deflexed towards center of inflorescense ..... *A. ferox* Mill.
10a. (7b) Plants small or medium-sized, without any evident stem 11
—b. Plants taller, stems often evident; lvs. to 20″ long or more 22
11a. Lvs. very numerous, aristate-pointed; rosettes divided dichotomously ..... *A. aristata* Haw.
—b. Lvs. fewer, not aristate, rosettes undivided, or dividing irregularly 12
12a. Plants small; lvs. rarely over 8″ long, often armed on back 13
—b. Plants larger; lvs. 8-20″ long, armed neither on back nor face, but often blotched 18
13a. Lvs. thick, more or less convex above; peduncle without bracts ..... *A. brevifolia* Mill.
—b. Lvs. thinner, concave above 14
14a. Lvs. more or less armed on face, or back, or both, as well as at edges, usually glaucous; peduncles with bracts 15
—b. Lvs. armed only at edges, green ..... *A. heteracantha* Bak.
15a. Lvs. relatively narrow 16
—b. Lvs. relatively broader ..... *A. humilis var. acuminata* (Haw.) Bak.
16a. Lvs. green ..... *A. humilis* (L.) Haw.
—b. Lvs. glaucous 17
17a. Lvs. to 10″ long or more. Hybrid ..... *A. x spinosissima* Hort.
—b. Lvs. rarely over 4″ long ..... *A. humilis* var. *echinata* (Willd.) Bak.
18a. (12b) Leaf margins entire or minutely and obscurely toothed 19
—b. Leaf margins more or less conspicuously toothed 20
19a. Lvs. with edges quite entire, obscurely lined ..... *A. striata* Haw.
A. Lvs. with margins reddish ..... var. *rhodocincta* Hort.
—b. Lvs. with a few distinct, but usually small teeth ..... (Hybrids between *A. striata* and *A. saponaria*)
20a. (18b) Perianth conspicuously inflated at base 21
—b. Perianth otherwise, at most slightly narrowed above ovary ..... *A. saponaria* (Ait.) Haw.
21a. Marginal teeth 1/8-1/6″ long. East Africa ..... *A. lateritia* Engl.
—b. Marginal teeth 1/5-1/3″ long. North to Angola, etc. ..... *A. zebrina* Bak.
22a. (10b) Perianth rounded to pedicel; segments free 23
—b. Perianth tapering to pedicel; segments mor or less connate 25
23a. Plants dichotomously branching; racemes lax at the base 24
—b. Plants branching irregularly; racemes dense and showy ..... *A. arborescens* var. *natalensis* Berg.
24a. Lvs. glaucous, with whitish teeth ..... *A. succotrina* Lam.
—b. Lvs. green, with purplish teeth ..... *A. lineata* (Ait.) Haw.
25a. (22b) Peduncles with broad bracts; lvs. yellowish green, erect; stem usually short. (Mediterr. Region, Canary Isl., etc.) ..... *A. vera* L.
—b. Peduncles with narrow bracts; lvs. dark green, spreading, stem evident (Abyssinia, etc.) *A. eru* Berger
A. Lvs. spotted ..... *forma maculata* Hort.

GENUS EUPHORBIA

By G. A. FRICK

The favorite and most eagerly sought species of Euphorbia is E. obesa. Until recently E. meloformis was the only one of the meloformia group known to botanists, but in 1897 a plant of similar shape was found in Graaff-Reinet district of South Africa, and described by Dr. Hooker as Euphorbia obesa, (Botanical Magazine 1903 tab 7888).

Photo by West
Female E. obesa in bloom

Describing E. obesa in his elaborate treatise of the genus Euphorbia in the Flora Capenses (Vol. 5, Sect. 2) Mr. N. E. Brown says this is an easily recognized species of the Graaff-Reinet. It will soon become rare or even extinct if the present rate of collecting it there continues, for some enthusiasts have carried away hundreds of the plants for cultivation in their gardens, or for sale, and export. The Flora Capensis had only the female plant to deal with and describes the peduncles as simple. That is sometimes so, but often they are once or twice branched, perishing after the seeds are shed, that means they are deciduous. The male plants are similar in shape, and their peduncles are also branched, rarely simple, but in both deciduous, and there are consequently no remains of old peduncles on plants of either sex, as is the case in the true E. meloformis.

Of ten E. obesa in my collection, all have flowered this past summer; a striking feature in the structure of the flower (cyathium) of the male plants are the bracteoles that stand between the stamens, they being cut into linear lobes, each lobe with a red midrib an unusual feature in the genus, although probably occurring also in other species.

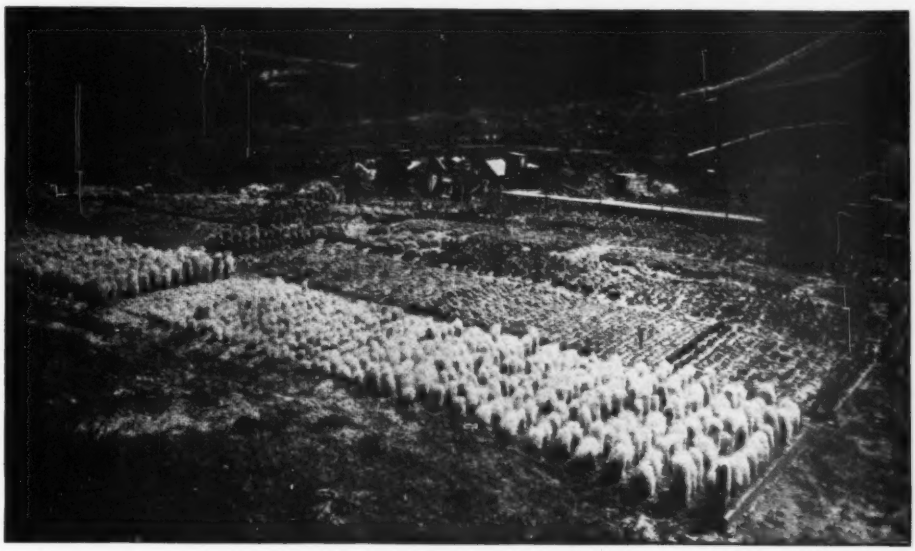
In the collection of Dr. Luckhoff of Cape Town, South Africa, there has been an occasional male plant that developed some bisexual flowers and produced a few capsules; and consequently I have watched for this development in my male plants, all of which have flowered, but so far I have not had the pleasure of seeing this occur. Two of my E. obesa are females and I have thrity-two seeds from these, but should have more had I understood its method of sowing its seed.

The seed pods of E. obesa adhere to the peduncles tenaciously for about ten days or until some influence causes great pressure back of the stopper-like pods, resulting in an explosion, somewhat resembling the popping of corn, and the seed contents are shot out scattering in all directions, a very novel way of distribution. To prevent the loss of the seeds I have fashioned a bird-cage appearing net made of mosquito screen, that fits over the plant, and as the seed of E. obesa will not pass through a 12-mesh screen, the seeds are saved; until I saw the explosion of the seed pods I thought birds were taking them.

I have never heard of cresting of E. obesa, but there are cases of sporting in the formation of an elongated cylindrical stem. Elongating of otherwise globose plants is of rare occurrence and is considered a monstrosity which perhaps has been produced by an accumulation of soil around a young plant, thus depriving it of sufficient light, or having started life in the shelter of a shrub where sun was excluded and thereby induced to stretch itself.

To my knowledge there are no available E. obesa on sale in the United States, and the only plant of this species I have ever seen sold, was a poorly rock molded specimen that brought $27.50 and sold readily. So here is a goal for you enthusiastic Euphorbia collectors to attain: try to get one.

Otto H. Roller, a member, had an exhibit of cacti 300 feet long at the New Jersey Flower Show, November 3rd, at Newark, N. J.



The First Cactus Beds at Lyon & Cobbe's, 1903

All plants in these beds were from Mexico and the Pacific islands on the west coast. The first bed was of the old man (Cephalocereus senilis) and the third of Mammillaria halei. The tall ones in background, in front of Mr. Braunton, were Pachycereus pringlei and Lophocereus schottii. The lane at the left is now Sunset Blvd.

LOCAL CACTUS HISTORY

By ERNEST BRAUNTON

More than 40 years ago I had charge of the lath house department of the nurseries of The Germain Fruit Company, at the northwest corner of Fourth and Los Angeles streets. There we had a few cactus, but nearly all were climbers or phyllocactus. There was no unusual interest in this class of plants at that time and no collection of note was known.

On January 1, 1893, I started a ten-acre nursery in the then northwest part of Los Angeles, between the city and the little settlement of Colegrove, now Hollywood, for Lyon & Cobbe. There was no street car service between the two places at that time. The firm for whom I was foreman started at once to specialize in cactus and other succulents, for a boom in these plants, the world over, was just beginning to assert itself. We had three collectors in Mexico, headed by the late C. R. Orcutt, of San Diego, and our first arrivals were from the mainland and Guadalupe, Cocos, Marguerita and other islands off the west coast, so that we soon had a large stock of species never before offered the public.

We bought heavily of McDowell of Mexico, Mrs. Nickels and Mrs. Bright of Texas, and of many in Arizona and other states. Whenever I could get away, I collected in California, being on trips for two weeks at a time and collecting many thousands. We bought many from A. H. Alverson, of San Bernardino, and from ranchers and ranch boys in all western states. Soon we had large fields and two large lath houses full, comprising the largest commercial stock of cactus the world had ever seen and I do not know of its equal today. There were private collections having several times the number of species, especially in Germany, but we had many carloads sent in of nothing but cactus, coming from every district in North America and Mexico where cactus were natives. Some of the species I have never seen since.

The prettiest species coming to me was Echinocactus trollieti and I do not know of one now. Ours went to the Royal Botanic Gardens, Kew, England, as did the best of everything we had. One plant of Echinocereus mojavensis contained 236 heads on one root, so claimed Orcutt, the collector, and was sold to Kew for $100. They paid equally high prices for many fine specimens, prices which in those days were positively

staggering to private owners. Our best customer was Haage & Schmidt, of Germany, though several German firms bought of us, as did others in England, Italy, France, and elsewhere. Several lesser dealers were established in Los Angeles but purchased nearly all of their stock of Lyon & Cobbe. The best private collection that I recall was that of Alec LaBonge, a barber of North Main Street, living on Ducommun Street. One of our best customers was A. S. White, who gave White Park to Riverside, where such a fine collection was maintained for many years.

We had a cactus magazine published in Baltimore, by the cactus club of that city, known as the Baltimore Cactus Journal, to which I was a regular contributor. When our local cactus club started a year ago, and before we had the present Journal, I gave to Mr. Frick, for the club, all the half-tone engravings I had, several of which have been used in the Journal. I also loaned him a bound copy of the Baltimore Cactus Journal, and from the latter, without explanatory note, was reprinted the article on "Soils" which our friend Ned Lawrence lands on so effectively with both feet.

We also had the Florist and Gardener, of Chattanooga, Tennessee, that specialized in literature cactaceous. They took photographs of a local collection in pots, a row at a time, published the illustrations and offered a prize for the one who could name the greatest number of them and published the winner's descriptions. I remembered I "copped" the prize and still have the magazine in which it was announced and the descriptions printed.

I was perfectly correct in my article on soils which Mr. Lawrence ably criticised and he would have needed only to see the series of articles of which this was one to realize not only the advisability, but the necessity of frequent watering. I have such a bed so treated at present. There are six inches of pure gravel on top of the garden soil, it is watered frequently and the plants grow as fast as other garden plants. I believe that in the old days I was recognized as the leading authority on cactus.

A CACTUS FANTASY

By MYRTLE SHEPHERD FRANCIS, Ventura, Calif.

Was Mother Nature discouraged when she looked at the desert and saw all that she had to do?

In the temperate zones, she had covered the mountains with towering pines and firs; on the hills and plains she planted massive oaks and a thousand lesser trees and shrubs and the *meadows were filled to overflowing with* lush grasses and myriads of lovely colorful flowers.

In the tropics lofy palms reared their graceful heads, great and small ferns uncurled their delicate fronds, bamboos fluttered their dainty leaves and every inch of space was filled with *vines and plants rioting for "a place in the sun."* Did she not thrill at the wonder of it? Did she not rejoice at her handiwork? And when she came to the arid regions was she not dismayed? Ah no ,for it is all one with Mother Nature, the harder the work, the greater the achievement.

The clear pure air shimmered in the early morning light, the great blue bowl of sky hung glittering overhead, the rays of the rising sun were like blasts from a mighty furnace, while now and then the fierce winds flung the undu*lating sand in swirls against mountain and cliff.*

She sat down to think, and from those thoughts was evolved the most wonderful of Nature's creations, not even the orchid, most ethereal of plants equals these, the cacti.

Plants to survive such conditions must have endurance, she mused, and vitality, perseverance, *originality, initiative, and her eyes twinkled,* a sense of humor. "Oh dear," she exclaimed, "I almost forgot beauty. It is really too much to give a plant all these other qualities and beauty too, but they must have some compensation for *their hardships."*

Out of the thread of her thoughts Mother Nature wove strong fibrous stems; stems long and straight; stems short and thick; stems flat or round; stems branched and twisted. On the *upper end of these stems, from her thoughts and* the mystery called life, she moulded layer upon layer of delicate watery crystal cells, and upon these cells she placed an epidermal wall of closer, finer cells and over all she drew a cuticle of glaucous blue, gray, green, dull purple, red or brown; *a cuticle so tough, so smooth, so fine,* that the moisture could not radiate, the sun's heat burn, nor the fierce winds break.

She chiseled ridges upon the surface of the giant Cereus; on the decumbent Cereus she *made protuberances and depressions,* the Echinocereus and Echinocactus and the Mammillarias she moulded, she kneaded, she patted into a thousand fantastic, grotesque and humorous

shapes. How ridiculous they looked, those long, bald, lanky, snaky stems; those short, bumpy, lumpy, warty stems. Mother Nature laughed until she cried.

Now what would she do for leaves? That was the question. Animals would eat them, the sun burn them, the cold freeze them and the winds blow them off. The thought came to her of the jewels of the night,—the stars; she would clothe them with stars. For the points of the stars she made spines; spines long and short; spines barbed and hooked; spines incurved, outcurved; spines soft as down or thick as wool; spines tough as horn or delicate as floss; spines red, yellow, white, black or brown, deftly fastening them on ridges; protuberances and tubercles in the most intricate geometrical designs. From the centers of these groups of spines she set the flower buds. Oh! the glory of the blossoms, that burst from those funny, lumpy, bumpy, warty stems. Sewed up and down the ridges of the giant columnar Cereus were delicately-ruffled golden or pink flowers. To the branching Cereus she gave large greenish-white blossoms, followed by luscious rosy red fruits; on the Opuntias she strewed flowers of red, orange, yellow and magenta with fruits as colorful as their flowers, and she decorated the Echinocactus, the Echinocereus and the Mammillarias with a bewildering array of gorgeous blooms of violet, rose, pink, scarlet and yellow with a texture so fine and satiny as to make the lily seem coarse.

Mother Nature now ready to plant, made a root of the other end of the stem,—a strong, woody root, covered with a thick, soft bark, able to absorb every particle of moisture that came near.

In the vast open spaces she planted forests of the Giant Cereus that rear their branches and columns to the sky. Over bushes and stones the scandent varieties trailed or clambered. With lavish hand she scattered Opuntias far and wide, over hill and plain, in nook and hollow, midst rocks and bushes. On cliffs and in crevices, she tucked Echinocereus, Echinocactus and Mammillarias. She planted and planted and planted until the evening was upon her and still there was cactus stuff in her bag.

"Oh! bother," said Mother Nature, "And I have run out of spines too. I simply can't spend any more time on this experiment, much as I would like to." So she gathered up all scraps but two and tossed them out in the desert, the two she dropped in the tropical forest saying, "Now let us see what you can do for yourselves."

Ages slipped by before Mother Nature gave her desert a thought, but the brilliant versatile forms of life she had given it were not idle. The Pilocereus, Echinopsis, Pereskia and the Rhipsalis came into being; the decumbent Cereus sent out long aerial roots to cling with, those planted late in the evening bloomed at night; many had developed a delightful perfume and all produced cristate or monstrous forms.

But the poor little bits without any spines, that were cast out in the desert so casual-like by Mother Nature, what had become of them? At first they felt most naked and forlorn especially as all the rest of the family were so stuck up, but they soon realized that if they were to survive they would have to do something. So they snuggled in the sand, they nestled close to rocks and they cuddled up to the roots of the Yuccas and bushes. Then they puckered, they flattened, they stretched, they thickened, they toughened and spotted their cuticle, each one trying as best it could to mimic the object nearest it till no one could tell the 'tother from which.

Now the two pieces dropped in the forest were highly delighted. One fell in the crotch of a tree, the other on the ground. The one on the ground proceeded to develop claws (the Epiphyllums, "Lobster" and "Crab Cactus") and clambered up by its cousin in the tree. Both had flattened their joints and stems and become leaflike (the Phyllo or "Case Knife" Cactus). They reclined on the limbs of trees in elegant leisure imitating the aristocratic orchids and bromiliads to perfection, their glorious flowers of magenta, scarlet, pink, white and rose rivalling the orchids in beauty and illuminating the dim forest with their brilliancy.

When Mother Nature returned she was radiant with delight as she realized what the cactus had done. She went from end to end of the desert and forest and explored every mountain and cliff marveling at their ingenuity. One Mammillaria had mimicked a Yucca, a Leuchtenbergia pincipis, another a piece of wormeaten wood, Pelecyphora aselliformis, another a flat starlike rock, Anhalonium fissuratum "Living Rock," but the most surprising of all were Anhalonium williamsii the "Dumpling Cactus" and Echinocactus myriostigma the "Bishop's Hood." Mother Nature clapped her hands as she exclaimed, "I can understand how they imitated the Yucca, the piece of wood and a rock, the 'Knife' but the 'Pudding in a bag' beats me." She continued, "You have all done everything and more than I expected of you, you are scientists of the plant world and the darlings of my heart."

THE CHROMOSOMES OF ALOE MACRACANTHA

By Dr. Donald A. Johansen, *Stanford University, Calif.*

In 1926 I gathered buds from a plant of Aloe macracantha (Baker) growing in the experiment garden of the Department of Botany at Stanford University, with the intention of ascertaining chromosomal constitution of this interesting succulent. The numbers were found to be 7 and 14, but were not published. In the meantime there appeared the paper of Nesta Ferguson (The Aloinae: a cytological study, with especial reference to the form and size of the chromosomes. Phil. Trans. Roy. Soc. London, B, 215:225-253. 1926). She found the behavior of the chromosomes in various Aloes to be somewhat unusual, hence I re-examined my preparations and found that the chromosomes of A. macracantha, while in general resembling those of the eight species examined by Miss Ferguson, exhibited a wide range of morphological forms. Later in 1926, the plant unfortunately perished from too much dirty water, thus putting a stop to the gathering of more material for a more comprehensive study.

Aloe is by taxonomists placed in the Family Liliaceae, tribe Asphodeloideae. The tribe is divided into two associations of genera, one including Kniphofia and Notosceptrum, the other, Aloe, Gasteria, Haworthia, Apicra and Lomatophyllum. In the latter group, Miss Ferguson examined all the genera except Lomatophyllum, which has not been known to flower in England. The majority of species belonging to these genera, she notes, grow on the dry steppes of the South African "Karroo," which bounds the southwest region of the Cape of Good Hope on the whole of the north and northeast sides.

Miss Ferguson investigated Aloe abyssinica, A. arborescens and its variety natalensis, A. cameronii, A. ciliaris, A. cristata, A. grandis and A. pluridens. Excepting A. ciliaris, all have seven haploid chromosomes, and, where counted, fourteen diploid chromosomes. A. ciliaris has about 45 diploid chromosomes.

It may be well, at this juncture, to give a brief explanation of the nature and importance of chromosomes. The plant body is composed of cells, which become specialized to serve various functions. The most important constituent of each living cell is the nucleus, composed principally of a substance known as chromatin. When a cell is about to divide, the chromatin becomes resolved into a certain number of morphological units known as chromosomes. The number is presumed to be constant for each species. Each chromosome splits lengthwise (they are usually much longer than broad) and each half moves to opposite poles along a peculiar structure made up of fine fibres and known as the splindle. The new cell wall is formed by the spindle fibers and in each daughter cell the chromosomes become grouped together, lose their identity and are reconstituted into a new nucleus. The whole proccess is known as mitosis and is strictly equational. However, when sexual cells are to be formed, an entirely different procedure, known as meiosis, is followed. Meiosis is an extremely complicated process and is one of the most im-

Fig. 1. Mitosis in epidermal cell of primordial petal.
Fig. 2. Late diakinesis in microsporocyte.
Fig. 3. Early metaphase and anaphase respectively of second meiotic mitosis.
(about x 1200)

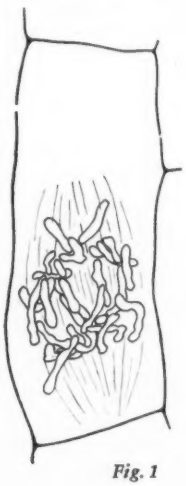


Fig. 1

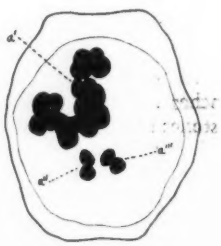


Fig. 2

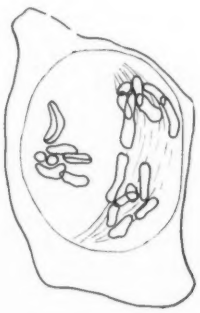


Fig. 3

portant phases in the life-history of the plant. At the beginning of the process, the homologous chromosomes become paired; one member of each pair was of maternal origin, the other paternal. In a first division each chromosome is separated from its homologue, and since there is no longitudinal splitting as in an ordinary mitosis, the number of chromosomes is consequently reduced in half. In a second division immediately following, each chromosome is divided equationally, as in mitosis. Each of the four resulting nuclei contains a chromosome set consisting of one member of each of the homologous pairs. The four nuclei differ qualitatively among themselves to the degree in which the various chromosomes differ from their respective homologues, and they furthermore differ from the mother nucleus in having only half as many chromosomes.

The nuclei in egg cells and in pollen grains have this reduced (haploid) number of chromosomes; when fertilization occurs, the number is doubled (the diploid number); petals, leaves, stems, roots, etc., have the diploid number of chromosomes in their cells. Fig. 1 represents an ordinary mitosis in Aloe macracantha; the chromosomes have already split and the daughter halves are passing to the opposite poles. Fourteen chromosomes may be counted in each group.

The reduced number is usually computed at that stage of meiosis known as diakinesis, when the homologous paternal and maternal chromosomes are paired. The peculiarity characteristic of meiosis in the Aloes is that at diakinesis there are four pairs and three unpaired individuals. The exact significance of this phenomenon has not yet been clarified by cytologists. For the species under discussion, Fig. 2 illustrates this phenomenon; each of the chromosomes has split preparatory to dividing, hence for convenience in identification the three unpaired chromosomes are designated a′, a″ and a‴ respectively. The cell in which they were found was a mother cell from which four pollen grains would be formed. The second meiotic division shows the haploid complement more clearly. Fig. 3 (in outline) is an example; there are two splindles; the group to the left has not yet divided although two of the chromosomes show the characteristic longitudinal split. There are seven units in each group in the figure to the right.

All figures are drawn at a magnification of about 1200, which gives one an idea of the extremely small size of the chromosomes.

The chromosomes have been called "the mechanical basis of heredity"; that is to say, they determine the hereditary behavior of the plant or other organism. The study of the chromosomes constitute one of the most important phases of present-day botany, and through the results obtained by cytologists, some of the most perplexing taxonomical problems are being solved.

Northern California Notes

The first meeting of the Northern Branch since last spring was held November 2, by the kind invitation of Mr. and Mrs. Max M. Cohn on their beautiful estate, Little Brook Farm, near Los Gatos.

Bay Region members at the Los Gatos meeting Nov. 2
Photo by J. West

The attendance was very good, about half of the total membership from all around the Bay being present. After a delicious buffet lunch in the large stone-flagged patio and a few short speeches the company adjourned to the cactus garden, which has recently been replanted, and now contains more than 350 species of cacti and succulents. Due to the exceptionally favorable climate, many species not often seen in this part of the state are here grown in the open, and were inspected with great interest. The many other features of the estate were then visited, the extensive Japanese garden, still under construction, evoking much admiration. The weather was perfect, and everyone had a wonderful time.

The Society is much indebted to Mr. and Mrs. Cohn for their more than generous hospitality.

We hope from now on to hold meetings more regularly than hitherto.

Dr. K. von Poellnitz, Oberloedla, Post Rositz, Germany, interested in Gasteria, Haworthia and Anacampseros, wants epiphytic cacti in exchange for seeds of rare species of Anacampseros.

CACTUS GRAFTING

By COL. PERRIE KEWEN

The word "graft," in gardening is a word applied to the shoot or scion that is to be inserted into the stock or branch of a rooted plant.

The origin of the word is from the French, "graffe," which signifies a pencil, and consequently in this sense, is supposed to have been derived from the resemblance the shoot bears to the point of a penknife, which was anciently called "greffe."

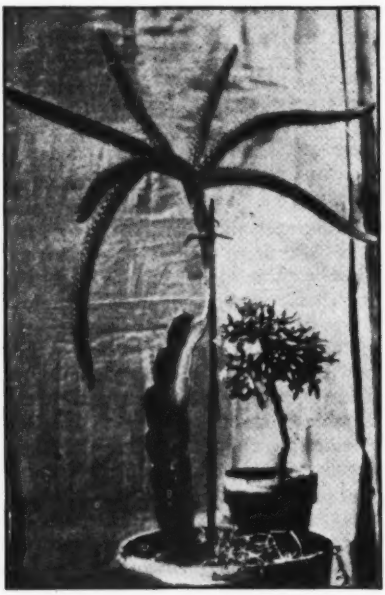
An ancient authority, Du Cange, goes farther and derives the word "greffe" from "graphionlum, a Latin word, signifying a little style; this instrument was an iron bodkin, one end whereof was pointed and served to write on waxen tablets; and the other flat, serving to efface or rub out what was written."

What constitutes grafting is the act of inserting a shoot or scion, which is the graft, taken from one plant into the stem or some other part of another, in such a manner as to unite and constitute a perfect plant of the same kind as that from which the slip or graft was taken.

It has been observed, that plants raised from seeds are liable to run from their kinds and create hybrids, owing to the mixing of the pollen by bees or flying insects, thus frequently generating new species of cacti; but in grafting, the graft that has been inserted and having become a part of the rooted plant, never alters from its kind, unless there are many different sorts crowded on one stem, in which way a seemingly great freak is often the result, but notwithstanding the fact of the grafts receiving their nourishment from the rooted stock, the variety remains as the original from which they were taken.

The main object of grafting is to procure a quicker growth and to improve and increase the bloom. To this end the stoutest and most rapid growing species are selected as stocks on which to graft the slower growing and more delicate varieties. The operation is also performed to preserve some tender, rare sort that is susceptible to water, and if left growing on its own roots, might develop a rot that would soon rob the collector of a valued specimen, but which, if securely grafted on a strong stem of a Cereus, is safe from such accident. Still another object of grafting, and one that is in great favor where the collection is a large one, is in the production of as great a curiosity as possible by grafting as many different varieties as can be clustered on one stem which often results in creating strange and interesting freaks.

In the grafting of the cacti, it is in fact imperative to select both the rooted plant, the subject upon which you mean to operate, and the specimen or graft that is to be annexed, that they both be in new growth, as you will find it far more successful than inserting a scion that is dormant. Where they are in new growth they unite quickly, and it is only a matter of a few



Courtesy J. H. Collander

weeks until you will find your efforts successful, while if either is dormant, it is possible that they may unite and remain green for an indefinite period and eventually dry up, for they very seldom mature.

In the case of a globose graft which is to be grafted upon another plant, whether columnar or globular, be careful to cut the graft above the root perfectly smooth as well as the top of the rooted plant, so that they unite perfectly, for in case they are not cut evenly, air is sure to penetrate and cause a miscarriage, as air drys up the lacerated parts causing a scab to form and prevents adhesion.

When the respective plants are cut and the graft placed in position for annexation, fasten four strings of requisite length each opposite the other with a slip knot, a thin slice of cork on top of the graft to prevent the strings from bruising or lacerating it when they are drawn securely

and fastened over the top of the graft, and be sure that the pressure of the strings is sufficient to prevent any possibility of the atmosphere penetrating, as you will find that all raw parts will invariably become dry and shrink, which is caused by moisture, heat or air penetrating the wound. It is always advisable to place a small flower pot over the graft as a protection from atmospheric conditions.

The wedge graft:—these are inserted either on the top of a plant or on the side. As the word indicates, the graft is cut evenly on both sides in the shape of a wedge, and as a rule is used in grafting all slender varieties such as Epiphyllums, Cereus flagelliformis, etc.

When inserting a graft on the side of a strong growing Cereus, be sure to make your incision in line with the ridge containing the spines, as you no doubt have observed that it is upon this ridge that the plant produces both the buds and offshoots, and when the graft becomes healed proceeds to mature accordingly.

Upon making your incision in the rooted plant, insert the wedge shaped graft into the incision so that none of the lacerated part is exposed, secure it in place with a spine, then wrap it with cotton string in such a manner as to prevent the incision from spreading apart.

The grafting of Epiphyllum on Pereskia is very simple, and is done by splitting the stock and cutting the graft to a wedge shape. Then insert the wedge and hold it in place by running a cactus spine through it, then fasten the string to keep the cut edges firmly together. The string can be removed in about a week as a perfect union should take place by that time. All growth that shows on the Pereskia stock should be picked off so that full strength may be driven into the new graft.

A collection of grafted plants is very curious and a source of unfailing interest, as their growth develops.

LETTER TO SECRETARY

I was so interested in the letter written to the Editor and signed F. Weinberg in the October issue of the Journal that, though my opinion may have little value, I venture to write a few thoughts on the subject.

I am no scholar—merely an earnest student of cacti for the past two years, but it seems to me that compiling of the monograph "Cactaceae" by Britton and Rose was a colossal task excellently accomplished, and I for one am deeply grateful to them. They have given us a greatly needed textbook in the English language. Of course there are imperfections, but they will be corrected.

Right here I wish to state that anyone who could differentiate all those Opuntias and remain sane has my most respectful admiration.

As to the "chaos," it seems to me that the "chaos" was already there, for, as far as I can learn, the foreign experts were not of one mind by any means. They disagreed and they changed names so that out of a possible six to sixty names, to me the earliest would seem to give the best working basis.

As for the new names and Britton and Rose following "no set rules"; are not all rules in plant naming a trifle too fluid to be "set"?

I am in hopes that our Society will grow so strong and far reaching that we may be able to put our branch of botanical names on as firm an agreement as bird students tell me their nomenclature is.

"How many know what a Ferocactus is?" Well those of us know who study the Br. and R. "Cactaceae," and the number is increasing rapidly.

I will leave the quibble about the Latin to the experts—my Latin's rusty, but my dictionary seems to agree with Britton and Rose.

While we are on the subject of "barrels" I would like a little help. We have in our garden the Whitewater or Devil's Garden barrel and the redder spined one from farther over on the Mojave. Now I just can't look those two plants in the face and call them the same name; they don't like it—they gasp at me. I have watched them through two blooming seasons, and while I am not botanist enough to tell if they both have the same caducous, imbricated, annulations behind the ears, yet they differ in appearance, color, spines, flowers, seeds and dispositions.

If the Whitewater plant is the acanthodes of Britton and Rose, what is the other? Such slight differences are noted in some plants that I do not understand about this.

Two field men of a persistent collector stopped at our garden recently, saying that they had found a Whitewater barrel growing merrily in a group of red ones over fifty miles from where it could be expected. They said it showed up distinctly different from the others.

We also have one Whitewater barrel which has the central thorn hooked like a fishhook. He is no "wislezeni" either.

Not so easy to understand, this hobby of ours, but that is why it is so interesting. Can you help me out on this, for I confess I am a bit bothered?

Yours sincerely,

MRS. R. B. WHITEFIELD.

W. I. Beecroft of Escondido, Calif., has issued a new catalogue of plants. This catalogue will be sent on request.

THE COB-WEB HOUSELEEK

By JAMES WEST

Sempervivum arachnoideum is perhaps the most atrtactive member of the Semperviva belonging to the hardy or alpine section of the genus, Sempervivum proper or Jovisbarba, as distinguished from those belonging to tender or Canarian species of the sub-genera (sometimes given generic rank) Aeonium, Grenovia, Monanthes and Goochia. These latter are mostly natives of the Canaries, and will therefore not endure heavy frost. The alpine species, on the other hand, inhabiting the mountains of Europe (Pyrenees, Alps, Balkans) and extending into Asia, are for the most part absolutely hardy. They form about the only group of true Succulents capable of being grown in the open in all sections of the United States and Canada. (There are, of course, also hardy Sedums, but many of the hardiest kinds could only be called Succulents by courtesy.)

This fact alone would be enough to insure them popularity, but, on their own merits, they are quite the most charming of small Succulents, with their tight rosettes, neat and regular, and attractive, if not very showy, flowers. There is the greatest variety in the shape, texture and color of the rosettes, which vary from pale jade to deepest maroon, often with different-colored tips, and are furnished with all manner of integument in the way of down, fringe, wool and hairy threads.

They show to best advantage in the rock garden or on a wall, for which latter situation they are especially well adapted. Nothing prettier can be imagined than the way in which a houseleek will establish itself in a crevice by means of its numerous offsets, which soon fill every nook and cranny with a tight mass of rosettes.

Botanically the Semperviva belong, like so many other Succulents, to the Crassulaceae or Stonecrop family. From the nearly related Sedum the genus is distinguished by the greater number of petals and other floral parts (6 to many in Sempervivum, usually 5 in Sedum, stamens twice the number of petals in each case). The leaves are many, always densely imbricated in rosettes. The flowering stems, with alternate leaves, arise from the center of mature rosettes and bear numerous flowers in panicled cymes, yellow or whitish (always so in the Canarian section) or some shade of rose-purple (in the majority of the alpine species). Flowering rosettes usually die after flowering, their place being soon filled by the offsets.

It is easy enough to identify a Sempervivum as belonging to that genus, but when it comes to specific distinctions, the matter is quite otherwise. Of names there is no lack, indeed they are legion, but few would be bold enough to label a large collection of hardy houseleeks with any degree of assurance; this is due to the presence of almost inumerable variations, geographical or from local environment, or culture, or else the result of hybridization, either natural or artificial. It must be stated that the Semperviva are regrettably addicted to promiscuity; without the least regard for the poor botanist, they seem to produce hybrids at the slightest provocation even on their home ranges, and more than ever, of course, in a collector's garden. M. Correvon, the great Swiss grower of alpines, tells* of a French student, M. Viviand-Morel, who grew 6,000 plants in pots, among which he could distinguish no less than 600 distinct forms, all of them varying in their turn. Mr. R. Lloyd Praeger, who gave us that model of a good monograph, The Genus Sedum, is now working on Sempervivum, after having visited all the principal centers of distribution. When his book is published we may hope to get more light on the subject of nomenclature.

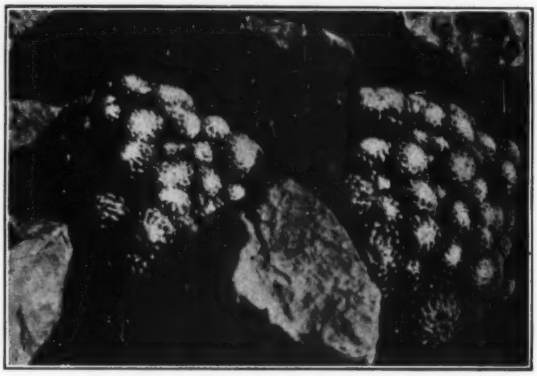


Photo by J. West
Sempervivum arachnoideum L.

In the meantime the botanical confusion need not keep us from growing houseleeks in all their endless variety. Some of the groups, in any case, are distinct enough, among them the one including our present species, the Arachnoideae. Their most striking characteristic is the presence of many fine silky white hairs produced from the edges and tips of the leaves, which overspin the rosette with a dense network, spiderweb-like in texture, often entirely concealing the leaves underneath.

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*Henry Correvon, Les Joubarbes, Brussels, 1924.

The typical species of this group is Sempervivum (lat. ever-living) arachnoideum (gr. arachne-spider) L., shown in our illustration, with small globular, white-webby rosettes and bright rose-purple flowers. It is found all over the Alps, principally on granitic formations at altitudes from 1800 to 7500 feet, also in the Pyrenees, the ranges of central France and the Balkans. A large number of variant forms exist, all of which have some time or other been described as species or varieties. But all these may very likely be only geographical variations of Sempervivum arachnoideum.

Some of them are fairly distinct, as for instance S. laggeri Schott (W. Alps). This has much larger rosettes than the type, flat or slightly concave on top, the sides strongly tinged with purple. S. a. v. atropurpureum Beauv. (Savoyan Alps) has larger and deeper-colored flowers, the hairs crowded at the tips of the leaves. S. hookeri Hort. is another larger form, more convex on top than S. laggeri, the dense tomentum concentrated at the center of the rosettes. S. moggridgei Hook. fil. is a smaller form with leaves even shorter than the type, from the Maritime Alps, having spherical rosettes and few-flowered cymes; this has been thought to be a hybrid with S. tectorum. S. sanguineum Jeanb. & Timb. is tinged with red all over the leaves and compact in habit, with flat-topped rosettes and small flowers; from the E. Pyrenees. S. tomentosum Lehm. & Schnittsp. (French Alps) is a form with large, flat rosettes with very dense white cobwebs and large, deep crimson flowers. This also goes under the name of S. webbianum or S. transalpinum.

In cultivation, few or none of the Succulents are easier to please than the alpine Semperviva. As might be expected from such high-montane plants, they will stand very low degrees of temperature, more especially if covered with a blanket of snow. But they will also grow in the heat and dryness of Southern California, where, however, they will soon lose their distinctive character, becoming pale and spindling. This change of habit when deprived of sufficient light occurs with surprising rapidity. I have known plants from the open, when transferred to the conditions of an indoor flower-show, to become almost unrecognizable in three days; the leaves become almost white, curve back and lose their tomentum, the rosettes loosen up and become elongated.

Although liking good drainage, the houseleeks are not easily rotted by an excess of moisture. In regard to soil they seem to be extremely adaptable. They prefer a fine, sandy soil rather rich in humus, but they will grow, if but indifferently, in heavy clay, also in sand or any ordinary soil. The merest scrap of soil suffices them, if they can get their roots behind some rocks where they will be protected from complete dyring-out. They are very responsive to good culture; with heavy feeding they can be grown on into rosettes as large as an Echeveria (this is true only of the more robust species such as S. tectorum, not of such miniatures as S. arachnoideum).

The cob-web houseleek is perhaps a trifle more sensitive to deficient drainage than some of the others, but even so not at all difficult to grow. It seems to be quite indifferent to chemical composition of the soil, which is rather remarkable, as it is supposed to occur only in non-calcareous locations in the Alps. In cultivation it will certainly thrive in a limy soil. The specimen shown in our illustration was grown in almost pure ground plaster.

The plants lose their dense cobwebs when not in active growth, retaining only a fringe of short hairs along the leaf-margins. Evidently this tomentum is developed as a means of protection for the tender young leaves, shed when no longer needed. The white hairs of so many Mammillarias, Cephalocereus senilis, Opuntia ursina, Echeveria setosa, etc., are similar instances of protection in other genera. From a short distance, a clump of Neomammillaria fragilis could well be mistaken for S. arachnoideum.

All Semperviva are of easiest propagation. The offsets, in nearly all cases abundantly produced, need only be detached from the mother plant. They will begin to grow as soon as planted; roots are generally formed on the young offsets while still attached. Propagation from seed is equally easy, but somewhat slower. The young seedlings of the different species are almost indistinguishable from one another, not developing their distinctive characteristics for several months.

The houseleek is intimately bound up with the folk-lore of Europe. It was regarded as a mysterious plant, with medicinal and magic properties. The English name derives from the custom of growing it on the roofs (generally tile or slate) of dwellings. This was done as a protection from lightning, for the plant was sacred to the gods of the stormy sky, Jove among the Romans (whence the French name *joubarbe* = Jovis barba) and Thor among the Teutonic peoples. Even today Sempervivum tectorum (this species is the houseleek proper) is thus grown as a magic lightning conductor by the more primitive peasantry in parts of Europe.

(Continued on Page 118)

Trichocereus spachianus

By MYRTLE SHEPHERD FRANCIS

Trichocereus spachianus is in bloom today—spachianus (commonly called Pearl of the Desert). When we older Californians lack words to express wonder or admiration we resort to the Spanish, the language of love and beauty. So—looking in spachianus' snowy chalice we clasp our hands with delight and exclaim "muy gloriosa." Glorious indeed is this noble flower with

Photo by Wm. Hertrich

its triple row of flaring fluted petals, its emerald green center, and mass of delicate yellow stamens from which floats a delicious perfume. The stem is green also, and heavily tufted with fine black hairs. The flowers open in the early evening but, unlike most night bloomers, last throughout the next day. The final touch with which Dame Nature has graced this wondrous bloom is the little green fly that flits about and like an iridescent jewel, adorns the satiny petals.

The flower buds form about the top of the plant, and so large is a single bloom that the plant seems almost top-heavy. To see several of these magnificent flowers open at one time is a sight never to be forgotten.

The fourteen ribbed plant stems are columnar, and bright green in color. The young growth is covered with a network of golden spines that turn gray with age. It grows slowly without much branching and does not attain the great size of so many of the near-related cereus, this latter fact making it adaptable to the small cactus collection.

One who knew and loved these spiny plants has called them Nature's sculpture and statuary. None is more statuesque than Spachianus, nor among all the cacti is there a flower more lovely.

ED. NOTE: Trichocereus spachianus is one of the most popular for grafting stock.

6, The Avenue,
Kew, England

Dear Mr. West:

I have to acknowledge and thank you for the copy of the new Cactus Journal I received from you a few days ago, and heartily hope that it will flourish and develop into a real work on succulent plants, both horticulturally and scientifically.

If acceptable, I would be willing to occasionally contribute descriptions (in English) of new South African succulent plants in the same style as I do in the Gardeners Chronicle.

I am swamped with work, and after reading your excellent article upon Lithops the Journal was put aside, as I regret to say, forgotten until today, for at 80 my memory is not at all like it used to be, and I forget things easily.

With reference to L. Lericheana, Dint. and Schwant., this is beyond all question specifically the same as L. bella N. E. Br. and L. lateritia Dint. is identical with L. rubra N. E. Br. The latter is a very striking plant, ruby-red all over. But this sort of nomenclature is very characteristic of Dinter and Schwantes, they make species of the slightest variations, and Lithops especially is liable to vary greatly. My plants of L. turbiniformis are this year totally different in color and markings from what they were when I made my drawings of them! And I have made a drawing of two growths of *L. fulviceps growing upon the same root* that are utterly different in their markings, and I am quite sure Schwantes would not only have made two species of this one plant, but if he saw my plants of *turbiniformis* would certainly declared that they were a different species from those I have figured, and yet they are the same individuals!

Thanking you for sending the Journal to me, which, if it prove of proper value, will be subscribed to by Kew.

N. E. BROWN.

Dr. Houghton, who has been in poor health for several weeks, has gone North for a rest. We trust he may recuperate very rapidly.

GENERA TACINGA AND MAIHUENIA

By Dr. Arthur D. Houghton

The Genus Tacinga

This genus is at present monotypic (having but one species) although there is a strong suspicion that others may shortly be added. The name is an anagram of the Catinga which means a sparse chapparal in the Bahia, province of Brazil.

Tacinga comes between Opuntia and Nopalea. The stamens of Tacinga are erect and non-sensitive; while the stamens of all Opuntias are sensitive; that is, they move when touched, like the leaves of the sensitive plant, Mimosa pudica. The areoles, leaves and glochids of Tacinga are similar to those of Opuntia; the petals of the flowers of Tacinga are narrow, green and recurved. No Opuntia has recurved petals. Tacinga also has one or more rows of hairs between the stamens and the petals.

Tacinga funalis, Britton & Rose, is the only species definitely known; no specimen of this plant is known to exist in any private collection in the United States, although the writer is hot upon its trail.

Dear reader, if you happen to live in Bahia, a few seeds of this plant, one of the commonest in the Catinga, would gladden the writer's heart.

This species grows erect at first, then clambers over shrubs and trees, with stems up to 30 or 40 feet in length. It is slender and woody with areoles borne on low ribs; the flowers including ovary, nearly three inches long. The sepals and petals are green; the style is elongated, thread-like, slenderer below with five green stigma lobes; the fruit is about two inches long.

The Genus Maihuenia

This genus has five recognized species and is very similar to Opuntia except that its seeds have thin, black, shining testa (skin), while the testa of Opuntia seeds is thick, pale and dull.

Maihuenias have no glochids; this also distinguishes them from Opuntia. The Maihuenias form small, dense mounds of low cespitose (branching into little tufts) plants. The leaves are small without angles, and persistent; there are usually two long white bristles in the axils of the leaves, while the areoles are filled with white wool. Each species has one long central spine and two short laterals. The flowers are large yellow or red; stamens and style much shorter than the petals.

M. patagonica is from near the snow-line on southern mountain ranges of Argentina and Chile. It is the only one of the five species with nearly globular joints. The other four, M. poeppigii, M. brachydelphys, M. valentinii, and M. tehuelches, have joints which are from oblong to cylindrical.

Of this last mentioned four, M. poeppigii with its linear leaves can easily be told from the other three. It is from the high mountains of Chile. Its fruit is ovate, two inches long with pointed persistent scales; flowers are terminal, yellow. It has formerly been described both as an Opuntia and a Pereskia.

M. brachydelphys, M. valentinii, and M. tehuelches have leaves which are ovate to subulate. M. brachydelphys can be told from M. valentinii and M. techuelches by the fact that its joints are only spineless below; while in the two latter, the joints are spiny all over. M. brachydelphys is from the province of Mendoza, 34° south latitude in Argentina. Its joints are only about one inch long; its spines are yellow, brown at base, flowers red usually from tips of joints; fruit narrowly fusiform (spindle shaped).

M. valentinii which has leaves on its ovary with white hairs in their axils, can easily be told from M. tehuelches which has no hairs in the axils of its ovary leaves. M. valentinii is shrubby, up to ten inches tall; its flowers from near the ends of its branches. Flowers are one inch wide, sepals reddish, petals to white yellow, stigma lobes 5, ovary nearly globular. It is from the Territory of Chubut, southern Argentina.

Grace V. Freeland, a patient at the Stony Brook Tubercular Sanitarium at Keene, California, whose letter appeared in the September issue of the Journal, writes to thank those that sent her plants, and says her collection has increased from 10 to 40. She informs us that one keen-witted Texan sent her an Echinocactus tuberculata. She wishes to assure the sender it is taking the treatment and would like to know what the botanic name will be when cured.

Stanford University
Dept. of Botany

I have been so accustomed to making only one payment for dues and subscriptions in scientific associations that I entirely overlooked the fact that dues and subscriptions are distinct in the Cactus Society, hence, am enclosing a check for two dollars to cover the difference.

The first issues of the Journal were *so interesting* that I do not wish to miss any future issues.

DONALD A. JOHANSEN.

YOUR SECRETARY'S SPINAL COLUMN

By R. E. WILLIS, 2721 Bellevue Ave., Los Angeles

The Cactus and Succulent Society of America held its October meeting in the Lecture Room of the Los Angeles Public Library, the 31st of October, with a good attendance, considering that it was Hallowe'en night and many parties were in progress throughout the city. About 165 were present.

Dr. Arthur D. Houghton was the speaker of the evening. He demonstrated, with the aid of a blackboard, the first steps in the use of the "Botanical Key." It was a very difficult situation for the Doctor as he had in his audience people of every degree of botanical knowledge, from those who did not know the meaning of the phrase, "Botanical Key," to those who were capable of creating a key of their own. Those who were far enough advanced to know what it was all about and why, and not experts, received a great deal of benefit from the lecture. The ten o'clock closing hour of the Library cut the lecture short.

I have had several requests from "out-of-town" members to have an article published in the Journal on the above subject so that distant members might be benefited as well as local members. As Dr. Houghton is very busy on the manuscript of his coming book, perhaps we can prevail upon Mr. Eric Walther or Mr. James West to supply this need.

It is with regret that I have to announce that it will be impossible for the Society to meet, as previously announced, at The Rancho Santa Ana Botanical Garden of native plants of California. Mrs. Susanna Bixby Bryant, the owner of the gardens could not arrange a Sunday date during November or December, but will be able to next spring, at which time her garden will be more beautiful after the winter rains.

Our next meeting will be held in The Arroyo Seco Branch of the Los Angeles Public Library, 6145 Pasadena Ave., Los Angeles, on Saturday, November 23, at 8 p. m. At this meeting the by-laws of the Society will be revised and if time permits a short lecture will be given, and as usual three plants will be raffled off to members present.

The winners of the plants at the October meeting were: Out of Los Angeles County Members—Miss Katherine van Benthem; First choice of members present—Dr. Houghton; Second choice—Mrs. Ollie Haveland; Third choice—Mrs. Horace Cline.

As every one will be very busy during the latter part of December, arrangements have been made to hold our December meeting in th early part of the month. We will be guests of Mr. and Mrs. Whitefield of Riverside, Dec. 8, 12:30 P.M. A basket lunch picnic will be held in Fairmont Park, in the band shell, or if the weather is fair, in the open. Tables and seats will be provided. There are 16 gas stoves, free gas, for those who wish to fry chicken or warm up soup. Coffee will be served by the hosts; bring your own cups. After lunch we will adjourn to White Park. This park is famous for its large and beautiful ccati, principally Cereus and very large Opuntias. It is one of the show places of Riverside. Mr. and Mrs. Whitefield will present to the three lucky members present and to the winning out of Los Angeles County member not present Cereus childsi (cutting), Myrtillocactus geometrizans (cutting), Cereus dayamii (rooted plant) and Cereus cutting (not named). All very fine large specimens. To get to Fairmont Park—go out of Los Angeles on Valley Blvd., entering Riverside on 7th St., turn left at 2nd Fairmont Park sign. This is on Fairmont Blvd. This will be the last meeting of the year so let us make it one to be remembered. An exchange table will be arranged. You had better bring some nice plants for exchange as I am told the members in and near Riverside are going to turn out "en masse" and bring their extra plants with them. Mrs. Whitfield has a lovely collection of rare and beautiful cacti and succulents which you may see while you are in Riverside.

Only two people brought plants for exchange at the last meeting. We are glad to find that you are all so well satisfied with the plants you have.

I recently had the pleasure of seeing and enjoying the garden of Mr. and Mrs. William L. Otte of Santa Barbara and was very agreeably surprised to see such a really fine collection of plants, ranging through Cacti, Euphorbias, Echeverias and other Succulent, all arranged in a most charming and attractive manner. The outstanding feature of my visit was Mrs. Otte's enthusiasm. Their home is on a lovely mountain side, overlooking miles of mountains and valleys, a truly wonderful location for the home of the artist owner.

I also had the pleasure of seeing Miss Kate Walker's collection of plants. Miss Walker has an unique idea of interspersing her many varieties of Cacti and Succulents with every conceivable bulbous plant and other shrubbery.

Mrs. Lulie Smith of Salem, Mass., writes that she enjoys the Journal more than she can say and reads every word from cover to cover. I am sorry that space forbids publishing her enthusiastic letter.

Dr. Donald A. Johansen of Stanford University will spend a few days in Los Angeles and vicinity in the near future.

Miss Kate Sessions of San Diego was getting up a party to attend the meeting at Rancha Santa Ana.

Send in your questions. Mr. Weinberg will give you the real and accurate "low down" on any question about Cacti and Succulents.

Also send in any news items of interest to the Society and readers of the Journal.

It is with sorrow that we announce the death of a fellow member, Mr. J. J. Dean of Moneta, California. The Society extends its sympathy to the members of the family.

THE COB-WEB HOUSELEEK

(Continued from page 115)

By some it is also considered to be an efficient protection against the Devil and other evil spirits. It had its virtues in medicine as well as magic; poultices of the leaves were good for wounds, burns and inflammations; an old author states that the juice, mixed with an extract of crayfish and mother's milk would banish insomnia and nightmares.

Mr. Charles Francis Saunders found it growing in the mission garden San Juan Capistrano; this may not unlikely have been a relic of one of the items in the padres' herb garden.

QUESTION PAGE

By F. WEINBERG

How can one coax Phyllocactus to bloom when the plant is old enough but won't try?

There are some eighteen original known species which are mostly epiphytics from the tropics of South America, but like the Cereus the beauty of their flowers and ready response to intelligent care, has led to the production of about two hundred valuable hybrids by cross fertilization and through the many years of cultivation they have gradually adapted themselves to the soil. Since some of that tropical and epiphytical sap flows in their cells they require, to do their best, a light humus soil and moist atmosphere. Plant in smallest possible pots with plenty of drainage, replant only when necessary (pot bound) and then only into the next size larger pot. During the summer months when in growing condition give plenty of water, preferably sprays, gradually with-hold watering towards fall and during the winter months keep them as dry as possible in order that the new growth has a chance to fully ripen the wood or branches; occasionally a fine spraying is beneficial. The plant being pot-bound and the wood ripened, buds will appear towards spring. As soon as the buds appear, the plant or pot should stand where it is and under no circumstance should it be turned around or moved to another place, otherwise you run the risk of the buds dropping off. Now gradually give more water, preferably with a weak solution of liquid fertilizer (sheep or cow being best) and all flowers will open into bright colors.

In reference to Mr. Lawrence's article on page 93, Vol. 1, No. 5, I believe that the reason that his plants may have required less water is that the soil may have been heavier, thus retaining the moisture and requiring less water than can be applied to more sandy soil without causing rot.

I believe his expression of "small fry" as applied to those grown in pots is a bit unfair since there are possibly more cactus grown in pots than in the open ground; especially this is true in Germany where there are even more grown in pots. Potted plants can be more carefully studied and enjoyed and more perfect specimens can be produced. Xerophytes are most ideal as a house plant since they can stand the dry atmosphere of the living room better than many other plants. See the article on Mesembrianthemus by N. E. Brown.

The idea that a cactus should be supplied with conditions as near to its native habitat as possible is a false theory since many plants struggle under adverse condition and when taken into captivity they flourish far better than in their native habitat. Note Armacost's orchids, for example.

It should not be taken for granted that Mammillarias are more at home in the shade of chaparal. Remember that seeds are spread by birds who nest in the chaparral and the plants try to adapt themselves to their new environment. Mammillarias like the sunshine.

Opuntia bigelovii grows in sandy places and does not like water around its base but you will find that the roots go down five to ten feet in search of moisture and if you examine the soil you will find moisture three to five feet below the surface. This proves that they do like moisture.

Mr. Lawrence states that the chief function of cactus spines is to attract the deposit of dew at night. This is erroneous since spines are formed to ward off the sun rays similar to a lath house. Some claim that spines are for protection against animals; if this is true what causes so many to become hollow? Have you ever watched a hungry steer trample down the spines of a cactus in order to eat the pulp? For these reasons the chief function of the spines is for protection against sun as explained.

Judging from the photograph there seems to be plenty of moisture below the surface and seeping through the soil, otherwise it would seem impossible to grow such a jungle of entirely different species in such a small space.

EDITOR'S NOTES

By SCOTT E. HASELTON

For fear that your Editor may gain undue credit for the last issue of the Journal it should be stated that the credit is due not only to the authors but to the following who spent many hours in reading the articles, endeavoring to make them as near correct as possible: Mr. Willis, Mr. Weinberg, Dr. Houghton, Mr. Walther, and Mr. Frick These gentlemen did not assume responsibility for all proofs but they most kindly assisted in producing what has been considered the best issue.

The Journal is in need of two conscientious assistants and now is the time to affiliate oneself with a magazine that has already established itself in a new field. The value of the advertising has been proven and since the readers demand advertising we must supply more of it. We have a plan for someone to carry out and if he will communicate with the Editor and really wants to do his bit, the Journal will make still greated strides forward. We also need an associate Editor who will cover shows, books, and news items and comments of general interest to cactus fans. If we are to have a better Journal let's share some of the work which has for its reward the pleasure of contributing something to our hobby.

Edgar Baxter, Field Executive in the Boy Scout work, is now back in the city and was of great assistance in preparing copy for this issue. More workers like him will be appreciated. We are bound that this magazine will never be a "one man" publication and the more who take part in it the broader will be its contents.

No more free exchanges will be published. Those desiring to exchange plants can do so through the classified lines which will be very painless.

Mr. Weinberg, who conducts the Question page, is out of town on another collecting expedition but we can look forward to his page in the next issue. Send in your questions or you may send material for identification directly to him at 120 N. Gates St., Los Angeles.

Mr. J. A. Ekdom has promised us a photo of his prize winning succulents.

Mr. Kegley, our show publicity expert, has done himself proud in producing the full page of cactus in the Los Angeles Times of Nov. 17th. Publicity of this nature does much to promote the interest and culture of cactus.

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